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A Comparative Review of How the Policy and Procedures to Assess Research Impact Evolved in Australia and the UK

Abstract

This paper offers a systematic review of the evolution of research impact assessment in Australia and the UK. We consider its inception and detail the development of relevant policy and procedures in each country. The paper sets out the results of a comparative analysis of public policy documents, newspaper commentary and academic literature in both countries. We examined the differences and commonalities between the two nations, revealing evaluation criteria and uncovering justifications for the adoption of impact assessment. The paper highlights the convergence and divergence of the two countries' policy and procedures, as well as the political and bureaucratic contexts that have shaped their design and implementation. The paper shows that the synergistic, intermittent and iterative development of relevant policy and procedures in the two nations has been mutually beneficial for the evolution of retrospective impact assessment.

Keywords

Research Impact, Impact Assessment, Research Policy, Research Excellence Framework, Research Quality Framework

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Introduction

In recent years, the university has undergone a shift regarding its role in society. From its earliest function as the primary place of learning and scholarship, the contemporary university is now a service-provider competing within a complex commercial and knowledge landscape (Watermeyer 2012; Gibbons 1999). Performance-based research funding systems are one of many innovations that have characterised significant changes in the university sector. According to Hicks (2012, p.260), they "tend to be complex, dynamic systems, balancing peer review and metrics, accommodating differences between fields, and involving lengthy consultation with the academic community and transparency in data and results". These systems affect the allocation of universities' research funding, but also competition for prestige, which creates strong incentives. Recent developments in Australia and the United Kingdom (UK) have seen the introduction of impact assessment into these systems, reflecting a broader 'impact agenda' (Martin 2011). There is now explicit recognition that the purpose of these evaluation systems is not only to assess quality but to incentivise researchers, research units and universities towards new research processes and outcomes that benefit society (Smith et al., 2011).

Although many have highlighted the responsibility, and resulting accountability, that researchers have to society as a whole (Martin 2011; Pettigrew 2011), others have decried the strengthening of political steering of academic research (Collini 2011; Smith et al. 2011; Ladyman 2009). Impact assessment has been seen as "a more overt attempt than previously to shape the behaviour of researchers about topics and approaches" (Smith et al. 2011, p.5). In particular, concerns centre around privileging of disciplines and topics for which impact can be more readily evidenced and the potential for devaluation of 'blue skies' research in favour

of research with clear economic benefits (Penfield et al. 2014). As such, the impact agenda has shifted our understandings of research quality and value (Watermeyer 2012). In this way, impact assessment has come to be both a valuation practice (i.e. the assigning of worth or value) as well as an evaluative one (i.e. the process through which an entity gains a particular type of worth) (Lamont 2012). Through a detailed review of the progression of impact assessment, this paper is concerned with revealing these evaluation criteria and uncovering the procedures, institutions, and political structures that enabled them (Lamont 2012).

The purpose of the paper is to document the evolution of the retrospective assessment of research impact in two countries, Australia and the UK. It is based on the initial impression that approaches for assessing research impact in each country have been synergistic, intermittent and iterative to the mutual benefit of research policy development in both jurisdictions. To test this hypothesis, we undertook a systematic analysis of public policy documents, newspaper commentary and the academic literature in both countries, which was then sent out for fact-checking by relevant actors in each country. From this analysis, we built up a timeline, summarised in Figure 1 and documented below in four phases. The paper proceeds chronologically; it begins with the development and subsequent dissolution of Australia's Research Quality Framework (RQF) in 2004, followed by the establishment of the UK's Research Excellence Framework (REF) in 2008. It then examines the renewed political drive for impact assessment in Australia from 2011, followed by the post-REF commitment to impact in the UK from 2014. We examined the differences and commonalities between the two countries, drawing out justifications for adopting the assessment of research impact, the country context that shaped the implementation of such policies, and the intermittent convergence and divergence of policy and procedures to assess research impact that evolved in Australia and the UK. The paper shows that the interdependent development of research impact assessment in the two countries was mutually beneficial for its evolution.

Australia develop but abandon RQF, 2004-2007

The genesis of the RQF can be traced back to a five-year strategy 'Backing Australia's Ability' launched by the then Prime Minister, John Howard, in 2001. The strategy included commitments to strengthen links between industry and universities and the commercial application and translation of research (Commonwealth of Australia 2001). The agenda was refreshed in May 2004 through a series of announcements packaged as 'Backing Australia's Ability - Building our Future through Science and Innovation'. This included plans "to establish Quality and Accessibility Frameworks for Publicly Funded Research", because there is "no robust and consistent way to measure the quality of research conducted in universities and publicly funded research agencies and its benefits to research and the wider community" (Department of Education, Science and Training, 2004).[1]

In 2005, the then Minister for Education, Science and Training, Brendan Nelson, established a 13-member Expert Advisory Group to provide guidance on the development of the framework that was chaired by the late Professor Gareth Roberts, then of Wolfson College, Oxford University and a member of the Higher Education Funding Council for England (HEFCE) Board. An issues paper for the proposed RQF, "endorsed" by the Expert Advisory Group, was published in March 2005 (Commonwealth of Australia 2005b). The issues paper was debated in a number of forums, including a National Stakeholders Forum in June 2005, leading to publication of the 'Preferred Model' in September 2005 (Commonwealth of

[1] Relevant also was a major review of health and medical research, chaired by Peter Wills and commissioned by the then Health Minister Dr Michael Wooldridge. This report emphasised the "virtuous cycle of research, industry and government that contributes directly to the health of the population…" (Department of Health and Aged Care 1998). From here, in 2003, the Research Committee of the National Health and Medical Research Council established a working group in 2003, led by Terry Nolan, aimed at defining a new model for measuring research 'track record', known as MORIA, which was influential in the RQF impact model development (Brutscher et al. 2008, p.42).

Australia 2005a), which Nelson signed off by stating: "I commend the RQF Preferred Model to everyone interested in the development and implementation of an RQF in the pursuit of Australian research excellence". The 'Preferred Model' focused on both:

> the quality of research including its intrinsic merit and academic impact - academic impact relates to the recognition of the originality of research by peers and its impact on the development of the same or related discipline areas; and
>
> its broader impact or use, i.e. the extent to which research is successfully applied - broader impact or usefulness relates to the recognition by qualified end-users that quality research has been successfully applied (Commonwealth of Australia 2005a).

There are two significant points of note from this report. First, this seems to be the first time the word "impact" was used in this way to describe the broader benefits or contribution of research.[2] Second, the report explicitly raised the question "How should research impact be assessed?", while not offering an answer.

The Expert Advisory Group met twice after the release of the 'Preferred Model' and, in its fifth meeting on 20 December 2005 finalised its advice, taking into account feedback from another iteration of consultation. Shortly after, Nelson was replaced as Minister for Education, Science and Training by Julie Bishop on 7 January 2006. Perhaps as a consequence of the reshuffle, and the need to fully brief the new Minister, it was not until March that year that she formally received the Expert Advisory Group's final report. A press release, dated 28 of March 2006, states: "The Minister for Education, Science and Training, the Hon Julie Bishop MP, today received the Research Quality Framework: Assessing the quality and impact of research in Australia – Final Advice on the Preferred RQF Model paper from Professor Sir

[2] Around this period, the word 'impact' also seemed to be gaining traction in the UK, framed as 'economic impact', but with a very inclusive definition of 'economic'. For example, two years later, the UK's Warry report (2007) drew on this language to define 'economic impact' in a very similar way to that now used by HEFCE.

Gareth Roberts". The press release also announced a leadership change in the RQF development process: "To progress the work of the [Expert Advisory Group], I am now announcing the establishment of the RQF Development Advisory Group, to be chaired by Australia's Chief Scientist, Dr Jim Peacock AC. The group will provide advice on the next phase of the RQF process, particularly how the model, if adopted by the Government, could be most effectively implemented. I would like to take this opportunity to thank the [advisory group] and in particular its chair, Sir Gareth Roberts, for their dedication to this important task" (The Hon Julie Bishop MP 2006). Although not entirely clear, there is some suggestion this change in governance was the result of representations from some groups to the new Minister about the Expert Advisory Group's direction of travel (Illing 2006; Armitage 2006).

The newly formed Development Advisory Group established three technical working groups – on metrics, impact and IT. The Working Group on Research Impact (WGRI) was asked to make recommendations on an optimal methodology for assessing research impact, picking up the unanswered questions from Expert Advisory Group's final report. The WGRI met four times from June to August 2006 and published its final report in September 2006. The WGRI made key recommendations, highlighted in Box A, which have shaped the assessment of research impact since that time. As summarised in Box B, these recommendations were picked up in the final Development Advisory Group report published in October 2006, which outlined a recommended approach for the RQF (Commonwealth of Australia 2006). It is worth noting the WGRI report concluded "that impact metrics are novel and underdeveloped, and hence are neither robust surrogates for research impact, nor stand-alone tools to inform the allocation of research funds". The WGRI, however, provided a list of potential indicators that could help universities make their case for impact.

Instead of an indicator approach, it was suggested the assessment of impact would rely on evidence-based impact statements containing both qualitative and quantitative information.

In a 'Context Statement', the unit of assessment (a 'research group' in the WGRI language) would set out the direction, focus and nature of its research, and how that relates to research impact. Assessment of impact would take the form of a ten-page maximum 'Impact Statement' of observable, evidence-based claims against specific impact criteria for up to four case studies. The case studies were meant as illustrative examples of the claims made. Although the exact weighting for the impact assessment element of a funding formula had not been set, it was expected initially to be at least 10 percent (Grant et al. 2009).

During this period, some groups experimented with different aspects of the RQF (Haddow 2007). For example, in 2005, the Australian Technology Network and Murdoch University carried out an RQF trial focused on quantitative data relating to publications, such as journal impact factors and citations. Likewise, the Council for Humanities, Arts and Social Sciences (CHASS) published a report, based on workshops and consultation responses, which proposed a model for assessing quality and impact of research for the creative and performing arts (CHASS 2005).

The Minister, Julie Bishop, released the Development Advisory Group paper 'The Recommended RQF' on 14 November 2006 and announced the RQF would take place in accordance with the proposed model, and would involve the measurement of both quality and impact (University of South Australia 2009). It was anticipated that in January 2008 institutions would be asked to provide Expressions of Intention to submit to RQF, and universities would begin the submission process in March. Assessment was scheduled to start in July 2008, with funding implementation in 2009.

Implementation of the RQF occurred during much of 2007. Thirteen assessment panels were established with Chairs' being announced by the Minister in April 2007 and membership shortly after that (See University of Sydney 2007). The RQF 'Submission Specifications' and 'Technical Specifications' were published in September 2007. The RQF 'Submission

Specifications' provided an overview of the content and data requirements for submissions, as well as panel-specific guidance for Research Groups. It also guided eligible higher education providers on policy and practical matters in preparing materials (Commonwealth of Australia 2007a). The 'Technical Specifications' described the interfaces provided by the Department of Education, Science and Training (DEST) for the electronic submission of data according to the requirements outlined in the 'Submission Specifications' (Commonwealth of Australia 2007b).

However, development of the RQF came to an abrupt end when, on 14 October 2007, Prime Minister Howard announced a Federal election in Australia. This resulted in a change of government on 3 December 2007 with the centre-left Labour Party winning under the leadership of Kevin Rudd. Shortly following the election, on 21 December 2007, the new Minister for Innovation, Industry, Science and Research announced the RQF would not proceed: "The RQF is poorly designed, administratively expensive and relies on an 'impact' measure that is unverifiable and ill-defined" (Donovan 2008).

Box A. Executive Summary from the Working Group on Research Impact

"The Research Quality Framework Development Advisory Group has developed the following key recommendations for the optimal methodology for assessing research impact as part of the RQF:

- Research impact is the social, economic, environmental, and/or cultural benefit of research to end-users in the wider community regionally, nationally, and/or internationally.
- The impact to be assessed for the RQF will be that impact which occurs during the six-year assessment period, but may be based on original research conducted earlier.
- Impact will be attributed to institutions based on the location of Research Groupings during the six-year assessment period.

- No minimum quality rating will be necessary for impact assessment, however, the research from which the impact is derived must be sound.
- Institutions will have the discretion to nominate Research Groupings of no less than five researchers for assessment as this best corresponds with their strategic focus.
- The basis of assessment for a Research Grouping will be an Impact Statement of no more than ten pages, which includes a statement of claims against impact criteria, up to four case studies illustrating those claims, and details of end-users who may be contacted as referees.
- Verifiable and auditable indicators should only be used, where appropriate, as evidence to support qualitative claims of impact, given that impact indicators lack robustness and cannot be used as a proxy.
- Expert Assessment Panels will be constituted of six core members, plus three expert end-users to conduct impact assessments and three discipline-specific researchers to conduct quality assessments.
- Impact will be assessed against a five-point rating scale, plus a rating of "Not Assessed".
- Funding will be allocated to institutions whose Research Groupings receive ratings of "D" and higher to encourage a greater uptake of Australian research.
- Excellence will be rewarded by allocating enhanced funding to those institutions whose Research Groupings receive the highest impact ratings.
- Clear guidelines, both for submission and assessment, will be developed at the discipline-specific level during further development of the RQF.
- A pre-implementation trial of the impact assessment, along with quality, will be undertaken in 2007 across selected disciplines and institutions to thoroughly test the

RQF model" (Working Group on Research Impact, 2006).

Box B. Extract from the Development Advisory Group report

"The basis of the impact assessment for a Research Group will be an Impact Statement of up to 10 pages, including:

- an evidence-based statement of claims for the Group against generic and panel-specific impact criteria, including verifiable indicators in support of those claims;
- up to four case studies that illustrate the Group's claims of impact; and
- details of end users who can be contacted by Assessment Panels to verify the Research Group's claims.

Impact assessments will also take into consideration the information provided as part of the Context Statement. Assessment Panels will be given generic indicators and will determine additional indicators of impact as appropriate for their discipline cluster. Research Groups unsuited to impact assessment because of the intrinsic nature or the stage of development of their research can make a claim for exclusion from the impact assessment in the Context Statement" (Commonwealth of Australia 2006).

The UK 'steals' RQF for REF, 2008-2014+

Early interest in returns from research investment within the UK can be traced back to the 1993 whitepaper, 'Realising our Potential - A Strategy for Science, Engineering and Technology'. This document demonstrated a policy imperative that "the benefits of scientific research will accrue to society at large", although it did not specifically introduce the term 'impact' (Chancellor of the Duchy of Lancaster 1993, p.1). More specifically, Smith (2011)

notes political interest in research impact from 2006. This included the Council for Science and Technology (CST), who advocated recognising and rewarding the varied economic and social functions of universities (CST, 2006), the Treasury, who referenced "greater rewards for user-focused research" (HM Treasury 2006, para.3.74) and the Department of Education and Skills (DfES), who highlighted the need for "user impact" measures in national research evaluation (DfES 2006).[3]

Historically, the Higher Education Funding Councils have assessed research quality as a means of allocating funding. To this end, the Research Assessment Exercise (RAE), and formerly the Research Selectivity Exercise, was conducted six times across UK higher education institutions between 1986 and 2008 (Smith et al., 2011). The UK government's intention to update the RAE was announced in March 2006, partly in response to ongoing contestation (e.g. Roberts 2003). After an initial consultation had been held by the Department for Education and Skills (DfES) in 2006 to lay out the general nature of reform, HEFCE coordinated a consultation on the newly-named REF ran from November 2007 to February 2008.

The plan was initially to replace the RAE with a cheaper and more streamlined system "based as far as possible on quantitative measures" (HEFCE 2007, p.34). A key theme in the proposal was reducing the cost and institutional burden of the assessment, which was met with general support: "Overall the majority of responses welcomed the intention to reduce burden compared with the current RAE, though many pointed to a tension between reducing burden and maintaining the rigour and integrity of the assessment process" (HEFCE 2008, p.2). However, the report noted "the operational difficulties of managing two distinct assessment processes" (i.e. metrics and peer review) (HEFCE 2008, p.3). As Professor Ian Marshall

[3] Indeed, this language and focus were reflected in the 2007 Warry report which made recommendations to the Research Councils for "achieving and demonstrating a step change in the economic impact of our investments" (Research Councils UK 2007, p.2).

argued, "politicians and the Treasury send out mixed messages. They want both world-class and applied research, but at a much lower cost. This leaves HEFCE trying to satisfy everyone" (Marshall 2008).

In line with the broader policy imperative that had been established, the explicit introduction of impact criteria in the REF emerged after this HEFCE consultation, in response to widespread opposition to a metrics-based system (e.g. Gill 2008). In particular, the consultation addressed concerns that a metrics and citation approach would be unable to gain an adequate picture of user value and impact. For example, "many suggested that the wider impact of research should be taken into account in light touch peer review" (HEFCE 2008, p.13). Indeed:

> Much of the discussion about metrics focused on the issue of user value and impact, and there were differing views about the importance of capturing this within the REF. Most argued that it is important for the REF to recognise and reward research that has a positive economic and social impact. Many saw this as essential, in line with government policy and vital to promote higher education's contribution to the economy and society (HEFCE 2008, p.14)

Thus, respondents demonstrated a desire for HEFCE "to explore ways of capturing impact and user-value across all disciplines and integrating this into the REF as a whole", and in general, favoured a revised framework that re-prioritised peer review over bibliometrics.

Proposals for the REF therefore explicitly acknowledged the political nature of the assessment, noting that rewarding research with clear economic or social impact reflects "policy aims in all parts of the UK to maintain and improve the achievements of the HE sector" (HEFCE 2009c, para.51). The primary aim of the REF was "to assess the quality of research and produce outcomes for each submission made by institutions" to inform the selective

allocation of funding, to provide "accountability for public investment in research" and "provide benchmarking information and establish reputational yardsticks" (REF 2014). Thus, with REF 2014, for the first time a further strategic aim was built into the proposals "to develop and sustain a dynamic and internationally competitive research sector in [each] country or territory [of the UK] that makes a major contribution to economic prosperity, national wellbeing and the expansion and dissemination of knowledge" (HEFCE 2009b, p.38).[4]

In February 2009, HEFCE commissioned an international review of how other research agencies measure impact in order to provide recommendations to inform the development of the REF. HEFCE identified several criteria for developing the framework; that it should be a credible, predictable and relatively easy-to-implement single approach that could encompass the full range of economic, social, public policy, welfare, cultural and quality-of-life benefits across disciplines (Grant et al. 2009). The review identified four contemporary international frameworks; the Australian RQF, the RAND/ARC Impact Scoring System[5], the United States' Program Assessment Rating Tool, and the Netherlands' Evaluating Research in Context. The report's key observations were that the Australian RQF provided a sound foundation for developing an impact framework for the REF (Grant et al. 2009, p.v). The report concluded that: "It is evident from this analysis that the Australian RQF provides the 'best fit' against the emergent criteria for REF… Hence our first key observation is that *the work of the Australian RQF Working Group on Impact Assessment provides a promising basis for developing an impact approach for the REF"* (Grant et al. 2009, p.55 italics in original).

The second consultation on impact was held between September and December 2009. Some respondents to this second consultation, including independent research funders such as

[4] This corresponds with the 2009 introduction of the Research Councils' requirement for a statement outlining "pathways to impact" for research proposals (Research Councils UK 2014).
[5] The RAND/ARC Impact Scoring System - RAISS - was the genesis of Researchfish, the research output data collection tool (Hinrichs et al. 2015)

Cancer Research UK, voiced concern around the pairing of research with political priorities, especially when benefits to wider society might not align with national concerns (Smith et al. 2011).

From here, during 2010, HEFCE developed a preliminary methodology that was subsequently trialled through an Impact Pilot Exercise, initiated to test the viability and suitability of retrospective impact assessment. Under the guidance of a specialised Impact Pilot Exercise Steering Group, the four UK higher education funding bodies delegated responsibility for the REF pilot to HEFCE (HEFCE n.d.). The Steering Group's role was to advise HEFCE on the implementation and outcomes of the pilot and to assist in the development of a workable and efficient approach to assessing impact in the REF. Adopting the RQF's use of a case study approach, HEFCE developed additional assessment criteria of 'significance' and 'reach' (HEFCE 2009a). This was based in part on an impact measurement model established by Brunel University that used similar measures of 'depth' (i.e. degree to which the research has influenced change) and 'spread' (i.e. extent to which the change has influenced end users) (Penfield et al. 2014). The focus on reach and significance was designed to permit the side-by-side measurement of diverse disciplines of research and types of impact (Scoble et al. 2010).

An invitation to participate in the pilot exercise had been issued in August 2009, and 75 expressions of interest were received from across the UK. The pilot involved a broadly representative 29 institutions, which submitted case studies to one of five units of assessment (i.e. clinical medicine, physics, earth systems and environmental sciences, social work and social policy, and English language and literature). These narrative-style case studies underwent peer review by expert panels during 2010, which developed 'impact profiles' using the case study approach (HEFCE 2010a; HEFCE 2010b; Penfield et al. 2014). The impact pilot exercise report was published in November 2010. Recommendations from the pilot's expert panels, made up of research active staff and end users from government, business and industry,

supported integration of impact measurement within the REF: "The feedback from Pilot Institutions has confirmed the feasibility of the approach tested through the pilot exercise; it is clear that [Higher Education Institutions] HEIs can document non-academic impacts and that in doing so a great majority will derive insight and local benefits" (Technopolis 2010, p.7).

Nevertheless, the introduction of an impact measure in the REF was not without controversy (Ladyman 2009; London School of Economics 2011; Russell Group 2010; Russell Group 2011). In December 2009, a petition established by the University and College Union (UCU) calling on the UK funding councils to remove impact assessment from the REF proposals was signed by 17,570 academics (UCU 2013). This petition reflected concerns over the rhetorical turning point evident in the REF2014. There was now recognition that the purpose was not only quality assessment, but "explicit steering" of researchers, research units and universities through strong incentives (Smith et al. 2011, p.6). This new strategic aim and the approach to impact has therefore been the subject of considerable ongoing debate (Parker & Teijlingen 2012; Hicks 2012; Watermeyer 2012). Critics argued that inherent in the REF was a move to redefine research processes and outcomes (Sousa & Brennan 2014), whereby universities must "modify their systems and processes in the research area to best position them for research evaluation systems and to maintain their legitimacy with a key stakeholder, the government" (de Lange et al. 2010, p.25). The introduction of impact has thus been re-defining what is meant by 'research excellence' (Watermeyer 2012), which has vast implications for universities and researchers.

In addition, the political context in the UK has been ambivalent on the issue of impact assessment at times. In 2009, it was reported that during a meeting at Conservative Party conference in Manchester, David Willetts, then Shadow Minister for Universities and Skills, said: "We do not wish to get into the clunky business of defining the outputs of research projects in advance…We don't want to see these things imported into the research excellence

framework" (As quoted in Newman, 2009). According to Newman, Willetts suggested it was "particularly offensive" to compel academics into bureaucratic box-ticking exercises of this type. In 2010, the incoming UK government delayed the REF for one year to 2014 for HEFCE to evaluate its design, and consider how impact could best be assessed. Newly appointed as Minister of State for Universities and Science, Willetts gave a speech at the Royal Institution on 9 July 2010 (BIS 2010), and another to the British Academy on 1 March 2011 (Department for Business, Innovation & Skills (BIS) 2011), outlining his approach to the modern university. As shown in Box C, in the space of two years, there is a distinct 'coming-around' to retrospective impact assessment in the REF, corresponding with the timing of the pilot exercise.

Box C. Extracts from speeches made by David Willetts

"The surprising paths which serendipity takes us down is a major reason why we need to think harder about impact. There is no perfect way to assess impact, even looking backwards at what has happened. I appreciate why scientists are wary, which is why I'm announcing today a one-year delay to the implementation of the Research Excellence Framework, to figure out whether there is a method of assessing impact which is sound and which is acceptable to the academic community. This longer timescale will enable HEFCE, its devolved counterparts, and ministers to make full use of the pilot impact assessment exercise which concludes in the Autumn, and then to consider whether it can be refined" (David Willetts, BIS, 2010).

"I know there are some in academia who have fears about impact. I myself was a sceptic, for we must never jeopardise blue skies research. Indeed, one reason for the £5 million increase in the British Academy budget in the spending review was to boost fundamental

research among the next generation of scholars. My own fear was that impact assessment would end up requiring clunky attempts to make impossible predictions about the impact of research activity. That's why I decided to delay the REF for a year for HEFCE to review its design, and decide how impact could best be assessed. HEFCE has since piloted it across several disciplines. The REF Panel on English Language and Literature was - by all accounts - one of the star turns in the pilot exercise. Indeed, the British Academy, the AHRC and the ESRC have each published excellent accounts of the impact of research in their fields" (David Willetts, BIS, 2011).

In March 2011, the 'decisions on assessing research impact' document was published, confirming the incorporation of 'impact' as a performance indicator within the REF at 20% of the total value available to each submission (a reduction from the initially proposed 25%). As shown in Box D, research outputs (65%) and research environment (15%) comprised the other generic criteria (HEFCE 2011).

Box D. Extract from Decisions on Assessing Research Impact

"Following the conclusion of the impact pilot exercise, the four UK funding bodies have decided that:

- In the REF there will be an explicit element to assess the 'impact' arising from excellent research, alongside the 'outputs' and 'environment' elements.
- The assessment of impact will be based on expert review of case studies submitted by higher education institutions. Case studies may include any social, economic or cultural impact or benefit beyond academia that has taken place during the assessment period, and was underpinned by excellent research produced by the

submitting institution within a given timeframe. Submissions will also include information about how the unit has supported and enabled impact during the assessment period.

- A weighting of 25 per cent for impact would give due recognition to the economic and social benefits of excellent research. However, given that the impact assessment in the 2014 REF will still be developmental, the weighting of impact in the first exercise will be reduced to 20 per cent, with the intention of increasing this in following exercises.
- The assessment of research outputs will account for 65 percent, and environment will account for 15 per cent, of the overall assessment outcomes in the 2014 REF. These weightings will apply to all units of assessment" (HEFCE 2011).

After a period of consultation on the draft panel criteria and working methods in 2011, where HEFCE allowed for some freedom of disciplinary panels to create independent standards and indicators (HEFCE 2011, p.5), the closing date for REF submissions was set as November 2013. 154 higher education institutions submitted 52,077 full-time equivalent staff, 191,232 research outputs and 6,975 impact case studies. These were assessed by 36 sub-panels (corresponding to each unit of assessment) working under the guidance of four main panels. Panels evaluated submissions throughout 2014, and the REF results were published in December 2014 (HEFCE 2014). The submissions and panel overview reports were subsequently published in January 2015 (HEFCE 2015).

The Australian 'impact boomerang', 2011-present day

Despite the newly elected Australian Labour Government abandoning the assessment

of research impact in December 2007, the idea returned to the agenda four years later when a research impact assessment mechanism was recommended in a government review of publicly funded research. The genesis for this 'U-turn' can be traced back to the establishment of a 10-year innovation strategy published in 2009 'Powering Ideas: An Innovation Agenda for the 21st Century' (Commonwealth of Australia 2009). This strategy included the establishment of the 'Focusing Australia's Publicly Funded Research Review' which was mandated to examine the degree to which the public investment model for research was effective in meeting the government's aspirations. The terms of reference for the review included "options to develop performance measures to evaluate publicly funded research programs" leading to the 'Key finding' replicated in Box E, and the recommendation that "the Department of Innovation, Industry, Science and Research undertake a feasibility study on possible approaches for developing a rigorous, transparent, system-wide Australian research impact assessment mechanism, separate from Excellence in Research for Australia, to evaluate the broader benefits of publicly funded research" (Department of Innovation, Industry, Science and Research, 2011).

Box E. 'Key finding' from the Publicly Funded Research Review

"Examining possible models for an assessment tool to evaluate the wider benefits of publicly funded research will be important to provide greater confidence in the value derived from public investment in research.

The government needs to ensure that its investment in research is well spent. Robust evidence on relative research performance arising from the government's investment is therefore essential. The Review found broad acceptance of the government's Excellence in Research for Australia (ERA) initiative as a rigorous method for assessing the quality of research being performed in Australia's universities. There is, however, no systematic process of measuring the broader economic, social and environmental benefits of publicly funded research

undertaken across the publicly funded research system as a whole.

Notwithstanding the methodological challenges in doing so, the Review found that there would be value in examining the feasibility of possible approaches for developing a rigorous, transparent, system-wide Australian research impact assessment mechanism, separate from ERA, to evaluate the wider benefits of publicly funded research. This examination could usefully draw on Australian and international experience in this area".

In the interim, the Excellence in Research for Australia (ERA) framework had emerged from the ashes of RQF. Administered by the Australian Research Council (ARC), the ERA seeks to identify and promote research strength in Australian universities. It involves a comprehensive evaluation of the quality of the research undertaken in all disciplines based on a suite of indicators. Committees of experts determine the final ratings of each assessed unit. The first full round of ERA occurred in 2010, and the results were published in early 2011. There have been two subsequent iterations of ERA in 2012 and 2015, with the next round taking place in 2018 (Australian Research Council 2017). Importantly, ERA has focused on the academic impact of research rather than the benefits research has had on wider society, and is metric, and bibliometric, focused.

The 2011 Publicly Funded Research Review also recommended a new Australian Research Committee be established to develop, among other responsibilities, a national research investment plan. The then Chief Scientist, Ian Chubb, chaired the Committee which produced the National Research Invest Plan in 2012 (Department of Industry, Innovation, Science, Research and Tertiary Education (DIISRTE), 2012). This document noted "in addition to measuring the excellence, academic worth and academic impact of research outputs, the [proposed] evaluation process will assess the broader economic, social and environmental benefits resulting from all elements of government research investment" (DIISRTE 2012, p.xi). It went on to note that during 2012, DIISRTE undertook a feasibility

study on possible ways of assessing the benefits of publicly funded research. The study determined it would be feasible to introduce two new research impact mechanisms: one focusing on universities and based on collection of case study and metric data, and another, more systemic, device integrating administrative data collected by government departments and programs, publicly funded research agencies and universities.

At the same time, during 2012, the Australian Technology Network of Universities and the Group of Eight undertook the Excellence in Innovation for Australia Trial, to assess the impact of research produced by the Australian university sector. The trial "sought to identify and demonstrate the contribution high-quality research has made to the economic, social, cultural and environmental benefit of society. Implicit in this goal was the purpose to investigate the means by which these benefits may best be recognised, portrayed and assessed by institutions and government" (Group of Eight Australia 2012). The trial was evaluated in 2013, which concluded it was successful but also made some recommended process improvements (Morgan Jones et al. 2013).

Despite repeated calls for the assessment of impact from reports commissioned by the government, and the proof of concept work deliver by the Australian Technology Network, the research funding system in Australia seemed to be dragging its feet on the assessment of research impact. For example, in 2013, an article in *The Australian* (Trounson 2013) reported that the leadership of ARC was not entirely supportive of either the assessment of research impact nor the use of qualitative case studies, an extract of which is provided in Box F.

This tension between the ARC and the government's desire to assess research impact seemed to continue through 2014 and 2015 until the publication of the National Innovation and Science Agenda (NISA) on 7 December 2015 (Department of the Prime Minister and Cabinet 2015). As part of NISA, the Government announced the development of a national engagement and impact assessment, which would examine how universities are translating their research

into economic, social and other benefits and incentivise greater collaboration between universities, industry and other end-users of research. Interestingly, this assessment would run as a "companion" to ERA.

In March 2016, membership of an Engagement and Impact Steering Group were announced, along with a Technical Working Group and Performance and Incentives Working Group (Australian Research Council 2016c). Shortly after, on 2 May 2016 the ARC released a consultation paper on 'Engagement and Impact Assessment' (Australian Research Council 2016d), with the consultation closing on 24 June 2016. It is clear the UK's REF was a key reference point for the Australian consultation. Among those that submitted consultation responses were the Group of Eight (Go8), who criticised the scheduled roll out which "has not allowed the same degree of underpinning work and certainly not the depth of work as was done before the implementation of the UK REF", and the Australian Sociological Association (TASA), who advocated adoption of "the broad UK REF definition" of impact and for a combination of qualitative and quantitative assessment measures (TASA 2016).

Box F. Extract from article in The Australian, 3 July 2013

"Australian Research Council head Aidan Byrne has advocated the use of indicators of impact, such as PhD completions, patents, commercial funding, and external research alliances, instead of case studies. He said that could complement the Excellence in Research for Australia process and allow the results to be compared. But he has expressed doubts over the feasibility of such measures because they may be open to gaming.

Professor Byrne warned there was a risk of "over-engineering" the effort to measure impact, and questioned whether a measure was needed at all. He said grant funding agencies such as the ARC were already working to encourage researchers to consider the impact of their research as part of their funding applications.

"This could achieve a number of outcomes without the measurement," he said".

Following the consultation, in November 2016 an Engagement and Impact Assessment Pilot was announced to take place in the first half of 2017 (Australian Research Council 2016a). The purpose of the pilot is to test the proposed methodology and processes, before national engagement and impact assessment in 2018. The pilot will test a mixed method approach, where engagement is assessed through a matrix of indicators with an accompanying narrative, and impact through case studies.

The proposed approach is an interesting innovation from the UK REF for a number of reasons. First, it differentiates engagement from impact, defining:

> **Research engagement** [as] the interaction between researchers and research end-users (including industry, government, non-governmental organisations, communities and community groups), for the mutually beneficial exchange of knowledge, technologies and methods, and resources in a context of partnership and reciprocity; [and]
>
> **Research impact** [as] the contribution that research makes to the economy, society and environment, beyond the contribution to academic research (Australian Research Council 2016b)

This decision by ARC to separate the two categories potentially creates confusion in terminologies, given that 'engagement' in the UK and elsewhere tends to refer to 'public engagement', whereas the Australian definition relates to knowledge exchange activities more suitable for quantification via metrics. As it currently stands, both categories would be included as 'impact' in the UK model. The separation also suggests a hierarchy of types of impact, which the UK definition seeks to avoid. This divergence of the two national systems is significant, and it makes possible further separation in future.

Second, it uses different processes for assessing engagement and impact. For the engagement, pilot engagement indicators are used such as patent and patent citation data, co-authorship of research publication, and research income. These indicators are supplemented with a narrative that describes the context, other engagement activities and any additional quantitative information. Impact is assessed primarily using qualitative information in the form of 'impact studies'. An impact study will describe the institution's approach to promoting the translation of the research into impact; the impact of the research; and, the underlying research. In addition to submitting impact studies by the unit of assessment (or Field of Research (FoR) code used in Australia), universities will be encouraged to submit interdisciplinary impact studies that cross FoRs.[6] Finally, as noted above, unlike REF the Australian assessment of impact will focus on the institution's approach to impact, that is, the mechanisms used by institutions to promote or enable research impact, rather than actual impact itself. Participating universities are making submissions to the pilot in the first half of 2017, with a review of the pilot report in late 2017 and the planned roll-out of the full assessment occurring in 2018.

An ongoing commitment to impact; 2014 to today

Following completion of REF 2014, the UK funding bodies commissioned a number of internal and external reports and evaluations to inform the Government and funding bodies on future policy development. Amongst a range of reviews on the nature and process of the REF, this included a two-phased evaluation of impact. The first of these, commissioned in March 2013, considered the institutional submission process for the impact assessment element of REF 2014. Using a mixed methods design involving interviews, site visits, surveys and cost analysis, the evaluation outlined a number of advantages from the increased focus on impact,

[6] The ARC will also use the Engagement and Impact Assessment Pilot to develop and test an evidence-based methodology for assessing Indigenous research impact.

but a corresponding and significant burden on HEIs and a number of unresolved uncertainties and concerns (Manville, Morgan Jones, et al. 2014). The cost analysis component put the cost of the impact assessment at £55M, out of £212M total to HEIs. The second evaluation, commissioned in August 2014, considered the assessment process for the impact element of REF. Using focus groups with panel members, users and impact assessors, interviews with panellists, and a comprehensive panellist survey, the evaluation demonstrated relatively high confidence in both outcomes and processes of the impact assessment (Manville, Guthrie, et al. 2014).

In September 2014, HEFCE also commissioned an analysis of the 6,975 impact case studies submitted to the REF from the Policy Institute of King's College London and Digital Science. The results of the text-mining project were published in March 2015 (King's College London & Digital Science 2015). The report found that the research underpinning the case studies was sizeable, multidisciplinary and varied, and the social benefit was multi-impactful and global. One key finding was "the quantitative evidence supporting claims for impact was diverse and inconsistent, suggesting that the development of robust impact metrics is unlikely" and that "impact indicators are not sufficiently developed and tested to be used to make funding decisions. (p. 143)", thus suggesting that narrative case studies are likely to be retained. The project also produced the REF impact case study database, produced by Digital Science, a searchable online tool permitting analysis and data mining of case studies (Digital Science n.d.).

A critical issue to be resolved for future policy development was the role of metrics in impact assessment. In April 2014, an Independent Review of the Role of Metrics in Research Assessment and Management team was established to undertake an examination of quantitative indicators in research assessment and management. The 'Metric Tide' report, published in July 2015, considered the application of metrics across different disciplines, and evaluated their

potential contribution to the development of research quality and impact (Wilsdon et al. 2015). The report concluded:

> For the impact component of the REF, it is not currently feasible to use quantitative indicators in place of narrative impact case studies, or the impact template. There is a danger that the concept of impact might narrow and become too specifically defined by the ready availability of indicators for some types of impact and not for others. For an exercise like the REF, where HEIs are competing for funds, defining impact through quantitative indicators is likely to constrain thinking around which impact stories have greatest currency and should be submitted, potentially constraining the diversity of the UK's research base. For the environment component of the REF, there is scope to enhance the use of quantitative data in the next assessment cycle, provided they are used with sufficient context to enable their interpretation.

Accordingly, the review recommended the UK funding bodies build on the analysis of the impact case studies to develop clear parameters for the use of quantitative indicators in future impact assessment. For example, the review recommended the development of specific guidelines and standards on the appropriate data to be collected to evidence different types of impact (for example, consistent monetary units).

Following a request from the Minister for Universities and Science, Jo Johnson, the UK funding bodies agreed to hold off on a consultation on the next REF until the conclusion of the spending review on 25 November 2015 (HEFCE 2016b). At this time, the Minister commissioned an independent review of the REF, which was announced by the Chancellor in his Autumn Statement (HM Treasury 2016). In December 2015, it was announced Lord Nicholas Stern would lead the independent review and a call for evidence was issued. The study was guided by a cross-disciplinary Steering Group, and based on over 300 evidence submissions, 40 interviews with universities, academics, users and intermediaries, and several

stakeholder meetings. The report was published in July 2016 (Stern 2016). As shown in Box G, the review identified a number of problems and issues with REF 2014 in terms of impact.

The review made a number of recommendations regarding impact for REF 2021. In addition to the three overarching recommendations outlined in Box H, the report recommended a significant broadening and deepening of the notion of impact, and that the impact statement should become an element of 'environment' assessment. Following REF2014, it was recommended the total weighting for impact comprise no less than 20% in the next exercise. Simultaneously to the Stern Review, HEFCE commissioned an assessment of the impact of publicly funded research across disciplines, culminating in a best practice guide on collecting research impact evidence (Vertigo Ventures and Digital Science 2016). The report, published in June 2016, drew together insights from Digital Science's text mining analysis, in addition to analysis of evidence as stored in a real-time impact tracker tool used by HEIs, a survey of impact sector experts, in-depth interviews with the REF Main Panel chairs, and a Research Impact Evidence Workshop with relevant stakeholders (held on 24 March 2016). The guidelines for best practice included: collecting evidence on impact throughout the research project; triangulating impact evidence to strengthen the impact narrative; linking specific research to a defined pathway to impact; and collecting and storing impact evidence in a way which enables it to be presented for both internal and funder use. This report demonstrates the need for HEIs to redefine research processes and outcomes (Sousa & Brennan 2014) in order maintain legitimacy and reputation.

Box G. Extract from Stern review 'problems and issues with REF 2014 regarding impact'

- "The responses to the review highlight the importance of the new impact section of REF2014 in broadening and in some ways deepening the nature of the REF exercise, in evidencing the importance of UK research to society, industry, the third sector and policy-

makers, and cultural health, and in encouraging scholars to consider different constituencies for their work.

- Nevertheless, a number of issues have been identified. As described above, linking impact case studies to the numbers of individuals submitted to each Unit of Assessment has added to the burden on institutions. It may also have contributed to (and distorted) the selection of individuals submitted to REF2014. It allows HEIs less freedom to adapt knowledge exchange and impact strategies to different academic units, with some involved more than others in impact activities.
- The requirement to link impact case studies to key research outputs has meant that potentially very valuable channels whereby the UK's research base impacts on industry, public engagement, and policy advice are not being captured. This may also be a disincentive for universities recruiting individuals from business and other sectors part way through their careers.
- Although many REF2014 impact case studies showed a degree of interdisciplinarity, the need to link back to research outputs may have constrained the submission of case studies where the impacts arose from collaboration across units of assessment, whether between departments in the same institution or between institutions…"

Box H. Recommendations from Stern review regarding impact

"Recommendation 5: Institutions should be given more flexibility to showcase their interdisciplinary and collaborative impacts by submitting 'institutional' level impact case studies, part of a new institutional level assessment.

Recommendation 6: Impact should be based on research of demonstrable quality. However, case studies could be linked to a research activity and a body of work as well as to a broad range of research outputs.

Recommendation 7: Guidance on the REF should make it clear that impact case studies should not be narrowly interpreted, need not solely focus on socio- economic impacts but should also include impact on government policy, on public engagement and understanding, on cultural life, on academic impacts outside the field, and impacts on teaching".

In December 2016, the UK funding councils published a detailed and technical consultation document on the future REF (HEFCE 2016a). The proposals presented in the document were based on the evaluation of REF 2014 and the recommendations in the Stern review. It outlined that REF 2021 will be centred on peer review of research outputs, impact and environment (informed by metrics, where applicable). The consultation set out 44 questions on issues such as the unit of assessment, panel configuration, staff, metrics, and research environment. 15 questions addressed impact assessment, including "What comments do you have on the recommendation to broaden and deepen the definition of impact?". Five events were held for HEI delegates during the consultation period, which outlined the key consultation questions and allowed for issues to be raised for clarification or discussion (HEFCE 2017). HEFCE also held a series of webinars, outlining key aspects and issues from the consultation events. The consultation closed in March 2017, and initial decisions on the next REF were published in September 2017.

Key amongst these initial decisions, and somewhat surprising given it was not explicitly recommended by the Stern Review, is an increase of the impact weighting from 20% to 25%. The increase was situated in "recognising the importance of REF-driven funding in supporting the industrial strategy" (HEFCE, 2017), which suggests a potential shift back towards the current Australian emphasis on business engagement and knowledge exchange. This is reinforced by the UK minister's recent announcement of plans to implement a Knowledge Exchange Framework "to benchmark the performance from university-business collaboration and knowledge exchange" (Department for Business, Energy & Industrial Strategy, 2017).

Together with the REF and Teaching Excellence Framework, this suggests an explicit emphasis on three key pillars of education, research and service.

From the suite of REF 2014 evaluations, as well as the consultation documents and initial decisions on REF 2021, several possible directions for impact assessment are observable. The first relates to definitional issues around the term 'impact' itself, with an identified need to broaden and deepen the definition (in line with that of Research Councils UK) and to provide guidance on specific types of impact. The second relates to the impact template, regarding (i) location, possibly to be incorporated within the assessment of research environment (ii) number, with a set minimum of case studies to be submitted, and (iii) structure, potentially with mandatory and optional fields within the case study. The third relates to the attribution of impact, where research may potentially arise from specific research, more general research activity or a particular 'body of work', and also the potential development of standards of quality and rigour for underpinning research (e.g. a two-star threshold). The fourth relates to the collection of evidence of impact, potentially to be divided into two separate categories: (i) audit, evidence that corroborates claims being made in the case study for verification purposes and (ii) assessment, evidence and indicators in the case study that allow the panel to ascertain reach and significance. The fifth relates to impact resubmission, and the potential for HEIs to submit impact claims to REF 2021 that were submitted to REF 2014, where impact is still being delivered. What is clear, however, is that the government and funding bodies consider the impact assessment of REF2014 to be a success and that we will see a strong ongoing commitment to impact in future policy development.

Conclusion

This paper sought to document the evolution of the assessment of research impact in two countries, Australia and UK. It aimed to uncover the procedures, institutions, and political structures that shaped the evaluation criteria contained in the assessment systems (Lamont 2012). From the above discussion, it is clear the Australian political system has been interested in impact since the early 2000s, but competing policy objectives and approaches impeded its progress. In the UK, on the other hand, the political impetus occurred later, in part because of a rejection of metric based systems, which allowed space for impact assessment to grow along with financial incentives provided by the funding allocation inherent to the REF. Financial inducements (direct for the UK, indirect for Australia) proved to be key in driving the methods of national impact assessment (i.e. narrative case studies vs. metrics), weighed up against the continual search to reduce transaction costs of evaluation.

Although it is widely acknowledged the UK's REF (and formerly the RAE) "have been the source of imitation and inspiration for other national academies seeking to formalise their own strategy in the determination of research excellence" (Watermeyer 2012, p.360), it is clear the evolution of impact assessment has been a back-and-forth process. Each country's policy development has been picked up on and developed through an ongoing process of international 'learning'. In each case, political drive has been central to the policy formation and implementation.

These political drivers have been coupled with a relative failure of HEI leadership to shape or head-off these imperatives. Despite the mission statements of many universities including a broad contribution to society, there has been a relative lack of interest from HEIs regarding the social contract (Demeritt 2000; Gibbons 1999). Indeed, proposals to begin measuring impact were not initially supported by academia in both countries, but opposition eventually gave way to political and pragmatic imperatives. This can be seen in the cycle of interpretation and adjustment of impact guidelines. For instance, many of the Stern

recommendations for REF2021 include much that was allowable under REF2014, but that were not widely taken up by HEIs. As a specific example, the Stern Review recommends the inclusion of public engagement in 2021 impact case studies. Yet, submissions of this type, such as the work of Brian Cox at the University of Manchester (REF Impact Case Studies 2014), were also permissible in REF2014. The interpretation of guidance by institutions has therefore been widely risk adverse. It has thus become an iterative process of relatively small shifts to impact assessment and ongoing clarification of guidelines and processes. More broadly, this shows the need for expensive, labour-intensive instruments such as the REF and ERA to mandate a core tenet of most universities' founding documents; to be in service of society.

For future evolution of policy, this paper suggests we are likely to see a continued political commitment to research impact assessment in both countries. The core debate going forward is likely to centre around reducing the perceived costs and burden of impact assessment through the use of metrics. This, in part, is related to whether the assessment of research impact is associated with direct financial incentives. In other words, the costs of assessing research impact as part of REF in the UK can be justified given the high level of funding that follows from the assessment, but this justification will continue to be more difficult in Australia. This would suggest Australia is more likely to take the lead on the development of lower cost metric based systems in the near future, which, given the iterative policy development to date, may subsequently be picked up by the UK. Thus, the two countries will continue their co-dependence in developing policy and procedures to assess research impact.

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